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ON THE TRACKS OF A NATURAL PUZZLE

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In October 1985 we encountered a natural phenomenon on wetlands of the Murray River delta in the Peel-Harvey Inlet, 70 km south of Perth. The observations are recounted here to espouse theories as to the cause of the occurrence and to encourage opinions from knowledgeable parties.

While observing wading birds we found impressions in the soft substrate of the Murray River intertidal mud and sand flats. These impressions were shallow subcircular hollows (Figure 1) ranging in diameter from approximately 10 to 30 cm and 5 to 15 cm deep. The hollows were extremely numerous in patches, but within patches appeared randomly distributed, with densities exceeding

Figure 1. Subcircular hollows.

20 per m^2 in places. A low mound or crescent of apparently recently turned sediment fringed one side of each hollow.

In addition to the hollows, and more remarkable, were tracks of overlapping semicircular impressions 10 to 15 cm wide trailing in straight or curving lines (Figure 2). It appeared that these tracks originated at a hollow and extended for distances ranging from only 15 cm or so to in excess of 3 m before abruptly ceasing.

Figure 2. Extended tracks.

Since the tracks appeared to originate at the circular depressions, we feel it likely that the same cause was responsible for both features. Neither of us has observed comparable features on mudflats or wetlands in eastern Australia. There the frequent use of yabby pumps by fishermen in search of *Callianassa australiensis* (marine yabby) can result in rounded depressions. The immense number of these features some distance from major human habitation and the very rare use of yabby pumps in Western Australian precluded this possibility. We assume natural causes.

The hollows showed no evidence of the burrowing activity of an invertebrate such as a large polychaete. The tracks appeared similar to those expected for large bottom-foraging invertebrates such as the king or horseshoe 'crabs', *Limulus* spp., which do not occur in Australia. The tracks seemed too regular to be a product of the common blue manna crab, *Portunus pelagicus*. After considerable thought, no invertebrate could be nominated as the

likely cause of these features and it was decided that they were probably produced by a vertebrate.

While the hollows appeared similar to the diggings of a canine such as the red fox, *Vulpes vulpes*, the huge numbers of these impressions made this unlikely and the tracks remained unexplained. Piscean or avian causes seem the only possible alternatives.

One author (G.M.) leans strongly towards the piscean effect. From evidence of high water marks, it appears that the intertidal flats would be immersed under approximately 15 to 20 cm of water at high tide. Schools of demersal fish could forage across the flats in sufficient numbers to produce the effects observed. Catfish seem a likely possibility, especially the cobbler, *Cnidoglanis macrocephalus*, which is very common in estuaries of the southwest coast. The circular depressions could result as the catfish foraged for small invertebrate infauna in the substrate. The tracks could result from fish moving progressively across the sediment, 'shuffling' as it were, with their ventrally placed mouths in contact with the substrate. The widths of the tracks correspond well with widths of cobbler heads.

After some discussion with colleagues, the second author (J.B.) suggested that avian causes are reasonable alternatives. Silver gulls, *Larus novaehollandiae*, occur in large numbers on the flats of the Murray delta. Gulls can forage for invertebrates in sediment by 'puddling' with feet or wings at high tide, hence possibly producing the depressions. The tracks might result from a gull progressing across the flat, puddling as it moved. Feeding swans, *Cygnus atratus*, are known to produce depressions but the tracking could not be readily explained.

Subsequent to the observations reported here, J.B. has encountered similar impressions on tidal flats of the Swan estuary. Given the immense numbers of these features on mudflats close to Perth, it seems inconceivable that they have not been observed before. Discussions with colleagues have not yielded a definitive explanation. We invite any interested parties to proffer theories for the causes of these remarkable depressions and tracks.

NOTES ON THE HERPETOFAUNA OF WOODY ISLAND, ARCHIPELAGO OF THE RECHERCHE.

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INTRODUCTION

Goodsell *et al.* (1976) recorded five species of lizards on Woody Island, Archipelago of the Recherche. These comprise two geckos and three skinks. During 26-29 September 1986, members of the W.A. Naturalist's Club visited the island where we carried out a reptile survey. Two additional species of skink, *Cryptoglepharus virgatus clarus* and *Morethia obscura* were recorded. Notes on all species recorded by us are included below.